

Title:

Self-Regulation of Learning: Exploring the Self-Regulated Learning
Practices of Pre-Service Teachers

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ABSTRACT

Self-regulation of learning is a process that occurs naturally in learning environments that allow learners to self-initiate and control the use of various learning strategies. Self-regulated learners are active agents of their own learning process metacognitively, motivationally, and behaviorally (Zimmerman, 1986). What are the self-regulated learning (SRL) strategies commonly used by such learners? This paper presents the findings of a study to document the SRL strategies of pre-service teachers in their second and fourth semesters of a Diploma in Education course in Batu Lintang Teachers' College, Kuching. Two hundred and twenty-eight pre-service teachers (67 males, 161 females) provided self-reports of the self-initiated learning strategies they used in various learning situations through responding to seven hypothetical learning contexts. Nineteen SRL strategies were identified from the responses. Pre-service teachers' frequency of use of SRL strategies ranged from "seldom" to "sometimes". Overall, there was no significant difference in the strategy use of Semester 2 and Semester 4 pre-service teachers but they differed significantly in the use of specific SRL strategies such as seeking information, social environment structuring, rehearsing, and seeking peer assistance. There was no significant difference in the SRL strategy use of male and female pre-service teachers. Implications and suggestions for further research are put forward.

INTRODUCTION

Motivation to Learn and Self-Regulation

Motivation to learn is seen as a function of both (a) a personal assessment of the meaningfulness of particular learning experiences or activities and (b) the process of self-initiating, determining or choosing, and controlling learning goals, processes, and outcomes (McCombs, 1994). Internal as well as external conditions influence motivation to learn. Internal conditions that can enhance motivation to learn include (a) an understanding of the self-as-agent in orchestrating thinking, feelings, motivation and self-regulated behaviors, (b) an understanding of natural capacities to control and direct one's own learning, and (c) perceptions that the learning task is personally interesting, meaningful or relevant. Meanwhile, external conditions that support the above internal conditions include provisions for relevancy, choice, control, challenge, responsibility, and support from others in the form of caring, respect, and guidance in skill development. McCombs and Whisler (1989) and Ridley (1991) are of the opinion that when learners perceive learning to be interesting, fun, personally meaningful and relevant and the learning environment supports and encourages personal control, then motivation to learn and self-regulation of the learning process occur naturally. The learner may not even be aware of being self-motivated and self-regulatory. Furthermore, research by Deci and Ryan (1985) has shown that if teachers have an autonomy orientation rather than a control orientation, learners will demonstrate greater intrinsic motivation and self-regulation. In recent years, self-regulation of learning, motivation to learn, and achievement have been the focus of much systematic research. The present study focused on self-regulation of learning.

What is Self-Regulated Learning?

Corno and Mandinach (1983, p. 95) initially defined SRL as “an effort put forth by students to deepen and manipulate the associative network in content areas, and to monitor and improve that deepening process.” Corno (1986) later defined SRL as the internalization of learning and task-management strategies, coupled with the ability to mobilize and maintain them when the situation demands it. According to Zimmerman (1986), SRL refers to the extent to which an individual is an active agent in his or her own learning process metacognitively, motivationally, and behaviorally. Self-regulated learners are metacognitively active in that they plan, organize, self-instruct, and self-evaluate at various stages during the acquisition process. They are motivationally active in that they perceive themselves as self-efficacious, autonomous, and intrinsically motivated. They are behaviorally active in that they select, structure, and create social and physical environments that optimize acquisition. Self-regulated learners are therefore learners who are actively involved in using academic self-regulatory processes during learning. Zimmerman (1994) defined academic self-regulatory processes as including planning and managing time, attending to and concentrating on instruction, organizing, rehearsing, and coding information strategically, establishing a productive work environment, and using social resources effectively.

Categories of SRL Strategies

Over the past two decades, considerable progress has been made in identifying the SRL strategies that students use. Zimmerman and Martinez-Pons (1986) investigated students' (aged 14-16 years) use of SRL strategies in both classroom and non-classroom contexts through the use of a structured interview approach. They identified 14 categories of SRL strategies, namely self-evaluation, organizing and transforming, goal setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequating, rehearsing and memorizing, seeking social assistance (from teachers, peers, and parents) reviewing records (such as notes and textbooks). In a study involving Australian, Japanese, and Japanese students studying in Australia (aged 16-18 years), Purdie and Hattie (1996) identified some 21 categories of SRL strategies and three non-strategic behaviors. The 21 categories of SRL strategies included: self-check, other check, self-test, summarize/note, outline/draft, highlight/underline, organize notes/files, goal-set/plan, seek information, keep records, physical environment structuring, self-environment structuring, use self-consequences, memorize, do practice exercises, seek peer assistance, seek teacher assistance, seek adult assistance, review notes, review tests/work, and review textbooks, while the non-strategic behaviors included use of willpower, cheat or copy and other (vague statements).

Wong and Siow (2003) identified the SRL strategies that local secondary school students used in learning science. The 19 SRL strategies identified from students' written self-reports included: self-check, using other sources of evaluation, selecting information, organizing informing goal setting and planning, seeking information, keeping records and monitoring, self-environment structuring, physical environment structuring, social environment structuring, self-consequating, rehearsing, memorizing, seeking peer assistance, seeking teacher assistance, seeking other (parents, siblings, senior students) social assistance, reviewing notes and completed work, reviewing texts. A review of the literature shows that there is hardly any documented study on the SRL practices of pre-service teachers locally or elsewhere. This study aimed to advance research in this area.

Age and Gender Differences in SRL

Students' self-regulation of learning and the pattern of SRL strategy use across the years of schooling has been a matter of interest to researchers. However, few researchers have conducted either longitudinal or cross-sectional studies to investigate the whole range of SRL strategies that students use. Zimmerman and Martinez-Pons (1990) compared the SRL strategies of 5th, 8th and 11th grade school students and found that there was generally an increase in the use of SRL strategies with age. The findings of Siow and Wong (2003) in a cross-sectional study involving Forms 2, 4 and Lower 6 students (aged 14-18 years) concur with the above findings. There was an increase in the use of SRL strategies as students advanced in school.

Regarding the SRL practices of boys and girls, previous studies involving students aged 14-18 years show that girls generally reported greater use of SRL strategies. Zimmerman and Martinez-Pons (1990) found that there were significant differences in boys' and girls' use of SRL strategies. Girls reported significantly more record keeping and monitoring, environmental structuring, and goal setting and planning than did boys. Bouffard, Boisvert, Vezeau, and Larouche (1995) made a similar observation in their study involving college level students. They found that girls reported significantly greater use of cognitive and metacognitive strategies and had higher academic performance than did boys. The more frequent use of SRL strategies was found to be related to girls' greater orientation toward learning goals than performance goals and higher intrinsic motivation for learning. In another study, Ablard and Lipschultz (1998) also found that girls used more SRL strategies. The present study aimed to investigate further into these age-related and gender-related differences in the SRL strategy use of pre-service teachers.

Objectives of the Study

Specifically, this study aimed to:

- (i) Identify the self-reported SRL strategies of Semester 2 and Semester 4 pre-service teachers.
- (ii) Compare the strategy use of Semester 2 and Semester 4 pre-service teachers.
- (iii) Compare the SRL strategy use of male and female pre-service teachers.

Research Questions

The following research questions were addressed in this study:

- (i) What are the self-reported SRL strategies of Semester 2 and Semester 4 pre-service teachers?
- (ii) Is there any significant difference in the SRL strategy use of Semester 2 and Semester 4 pre-service teachers?
- (iii) Is there any significance difference in the SRL strategy use of male and female pre-service teachers?

METHOD

Participants

Participants were 228 pre-service teachers (67 males and 161 females, mean age 21.18 years, $SD = 2.10$) who were enrolled in a Diploma in Education course in Batu Lintang Teachers' College, Kuching. Stratified purposive sampling was used to select four out of the six groups of Semester 2 pre-service teachers and six out of the 10 groups of Semester 4 pre-service teachers available

so as to involve an equal proportion of Chinese Option and Non-Chinese Option pre-service teachers. Ninety-one of the participants were Semester 2 pre-service teachers (24 males, 67 females; mean age 20.70 years, $SD = 2.21$), while 137 of them were Semester 4 pre-service teachers (43 males, 94 females; mean age 21.49 years, $SD = 1.97$). The sample consisted of 55.7% Chinese ($n = 127$), 25.4% Malay ($n = 58$), and 18.9% Iban ($n = 43$) pre-service teachers.

Instrument

Self-Regulated Learning Instrument

A Self-Regulated Learning Instrument, which required pre-service teachers to respond to seven hypothetical learning contexts (adapted from the SRL Interview Schedule developed by Zimmerman & Martinez-Pons, 1990) was developed to gather information on pre-service teachers' frequency of use of SRL strategies. The learning contexts were designed to elicit responses from pre-service teachers about the learning strategies they used in various learning situations such as (1) remembering information from class discussions, (2) preparing for an examination, (3) doing an assignment, (4) checking assignments, (5) completing assignments in the face of distractions, (6) learning new content, and (7) learning new skills in co-curriculum activities. The SRL strategies that were explored through the learning contexts included (a) information processing strategies such as organizing and transforming, rehearsing and memorizing, and (b) coordination and control strategies such as self-evaluation, goal setting and planning, seeking information, keeping records and monitoring, self-consequating, environmental structuring, seeking social assistance, and reviewing records such as tests, texts, and notes.

The SRL Instrument had a free-response or unstructured format where pre-service teachers had to write down the learning strategies they would use for the learning context described and the frequency of use of each strategy in similar situations. A free-response format was chosen in preference to an option item format to avoid giving cues or suggestions to students of the strategies they would use. According to Ley and Young (1998), the tendency to respond in the socially acceptable manner would be more likely when the student is cued with possible acceptable responses.

The instrument was piloted on a representative sample of pre-service teachers ($N = 58$) consisting of Semester 2 ($n = 30$) and Semester 4 ($n = 28$) pre-service teachers not involved in the actual study. It was found that pre-service teachers were generally able to give appropriate written responses to the learning contexts presented to them. Immediately after the pilot testing, the researcher took time to discuss with some of the pre-service teachers concerning the meaning and clarity of the statements in the learning contexts. Following that, minor adjustments were made to the wording in some of the learning contexts. According to Warwick and Osherson (1973), when pilot testing an instrument, it is particularly important to ask respondents not only for their response to the items but also for their interpretation of the item's meaning.

Data Analysis

Pre-service teachers' self-reports of SRL strategy use obtained through the SRL Instrument were analyzed in the following manner:

- (i) Pre-service teachers' responses were coded into categories of learning strategies by the researcher in this study. As a reliability check, approximately 20% of the responses (45 scripts, i.e. 18 Semester 2 scripts, and 27 Semester 4 scripts) were randomly selected and recoded after 2 weeks. Cohen's (1988) kappa value computed to find the degree of agreement between the two codings was .82, indicating that there was a high level of consistency in the coding.
- (ii) The coded responses were scored according to a procedure used in Purdie and Hattie (1996). The score for consistency of strategy use was obtained through weighting students' indicated frequency of strategy use in the following manner: 1 = *seldom*, 2 = *occasionally*, 3 = *frequently*, 4 = *most of the time*. Through summing the weighted responses for each strategy and dividing by the number of times the strategy was mentioned, a measure of the average importance a student attached to the use of each strategy was obtained. [For example, if a pre-service teacher mentioned the strategy "seeking information" three times, weighting each mention of the strategy as most of the time (4), occasionally (2), and most of the time (4), the average importance of the strategy for the pre-service teacher would be scored as 3.33.] According to Purdie and Hattie (1996), the score obtained in this way reflects the importance a pre-service teacher attaches to a particular strategy. It was therefore referred to as the strategy importance (SI) score.
- (iii) The means and standard deviations of the strategy importance scores for each category of SRL strategies identified were computed to investigate the level of strategy use of the pre-service teachers.
- (iv) Independent samples *t*-test was used to compare to SRL strategy use of pre-service teachers according to Semester and gender.

FINDINGS AND DISCUSSION

Pre-Service Teachers' SRL Strategies

One of the aims of this study was to identify the self-reported SRL strategies of pre-service teachers. Through content analysis of pre-service teachers' responses to the seven hypothetical learning contexts, 19 SRL strategies were identified. Appendix A presents some examples of pre-service teachers' responses for each category of SRL strategy. The categories of SRL strategies identified were quite similar to those already documented for local secondary school students (Wong & Siow, 2003).

Table 1 presents the means and standard deviations of strategy importance (SI) scores for each SRL strategy. As explained in Purdie and Hattie (1996, p. 853), SI values are "a measure of the average or typical importance a student attached to the use of each strategy." The ranking for the mean SI scores are included in the last column of the table. An examination of the mean SI values in Table 1 show that the mean SI values for SRL strategies ranged from .50 to 2.94, indicating that pre-service teachers' consistency ratings for their use of SRL strategies were between "seldom" and "frequently." The mean SI value for pre-service teachers' use of the 19

SRL strategies was 1.68, indicating that overall, pre-service teachers' consistency ratings for their use of SRL strategies was "occasionally." Responses that were vague or incomplete statements were categorized as "other."

As shown in Table 1, the six SRL strategies reported as most often used (ranked 1 to 6) were seeking information, self-environment structuring, keeping records and monitoring, rehearsing, seeking peer assistance, and selecting information. It appears that pre-service teachers were concerned about gaining more information (ranked 1) when undertaking learning tasks. Pre-service teachers were also aware of the fact that they could improve the effectiveness of the learning process through making a personal resolve or performing a particular personal behavior, that is, efforts at self-environment structuring. Pre-service teachers appeared to be aware of the benefits of keeping records and monitoring, and rehearsing, as these were the next most often mentioned strategies (ranked 3 and 4 respectively). Their practice of seeking peer assistance (ranked 5) reflects their resourcefulness in seeking help from course-mates when undertaking learning tasks. It appears that as pre-service teachers seek information, they employ a lot of techniques to select information (ranked 6) such as listing main points, summarizing, and highlighting or underlining.

Meanwhile, the six SRL strategies less often reported by pre-service teachers were reviewing texts, reviewing notes and completed work, organizing information, physical environment structuring, memorizing, and self-check. It appears that pre-service teachers seldom mentioned that they reviewed texts, notes and completed work (ranked 19 and 18 respectively) when preparing for tests. They also seldom mentioned efforts to organize information (ranked 17), such as making outlines and drafts when doing assignments. There was also little mention of efforts to select or arrange the physical setting (i.e. physical environment structuring, ranked 16) to make learning easier. There also appears to be little effort at committing information to memory through memorizing (ranked 15). Another strategy seldom mentioned was doing self-check (ranked 14). This implies that pre-service teachers seldom checked their own work, do self-tests, or reflect on the quality and progress of their work.

Table 1

Means and Standard Deviations of Strategy Importance Scores for each SRL Strategy

SRL Strategy		Strategy Importance (SI) Scores for the Whole Sample (<i>N</i> = 228)		Ranking
		<i>M</i>	<i>SD</i>	
1	Self-check	.80	1.42	14
2	Using other sources	2.28	.98	7
3	Selecting information	2.50	1.41	6
4	Transforming information	1.94	1.57	8
5	Organizing information	.68	1.33	17
6	Goal setting and planning	1.92	1.53	9

7	Seeking information	2.94	.95	1
8	Keeping records & monitoring	2.64	1.38	3
9	Self-environment structuring	2.91	1.02	2
10	Physical environment structuring	.74	1.31	16
11	Social environment structuring	1.10	1.45	12
12	Self-consequating	1.20	1.66	11
13	Rehearsing	2.56	1.24	4
14	Memorizing	.77	1.40	15
15	Seeking peer assistance	2.54	1.14	5
16	Seeking teacher assistance	1.76	1.42	10
17	Seeking other social assistance	.84	1.29	13
18	Reviewing notes & completed work	.65	1.30	18
19	Reviewing texts	.50	1.18	19
20	Other	.85	1.40	-
21	Overall (19 SRL strategies)	1.68	.39	-

SRL Strategy use of Semester 2 and Semester 4 Pre-Service Teachers

A further aim of this study was to compare the SRL strategy use of pre-service teachers in Semester 2 and Semester 4. Independent samples *t*-test indicated that overall, there was no significant difference in the strategy use of these pre-service teachers. However, comparison of their use of each strategy revealed that they differed significantly in the use of four SRL strategies, namely seeking information, social environment structuring, memorizing, and seeking peer assistance. Table 2 presents the means and standard deviations and results of *t*-tests of strategy importance scores for Semester 2 and Semester 4 pre-service teachers.

Table 2

Means and Standard Deviations and t-tests of Strategy Importance Scores by Semester

SRL Strategy		Semester		<i>t</i>
		Two (<i>n</i> = 91)	Four (<i>n</i> = 137)	
1	Self-check	.99 (1.53)	.66 (1.35)	1.73
2	Using other sources	2.84 (1.01)	2.74 (.97)	.71
3	Selecting information	2.34 (1.49)	2.60 (1.35)	- 1.35
4	Transforming information	1.92 (1.56)	1.96 (1.59)	- .17
5	Organizing information	.68 (1.41)	.68 (1.28)	.03

6	Goal setting and planning	2.12 (1.48)	1.78 (1.56)	1.62
7	Seeking information	2.76 (1.11)	3.07 (.82)	- 2.40*
8	Keeping records & monitoring	2.50 (1.52)	2.73 (1.27)	- 1.23
9	Self-environment structuring	3.01 (.91)	2.84 (1.08)	1.22
10	Physical environment structuring	.80 (1.31)	.70 (1.31)	.58
11	Social environment structuring	1.43 (1.52)	.88 (1.36)	2.84**
12	Self-consequating	1.22 (1.67)	1.18 (1.66)	.17
13	Rehearsing	2.70 (1.15)	2.47 (1.30)	1.35
14	Memorizing	1.02 (1.60)	.61 (1.23)	2.18*
15	Seeking peer assistance	2.26 (1.31)	2.73 (.97)	- 3.04**
16	Seeking teacher assistance	1.84 (1.45)	1.70 (1.40)	.73
17	Seeking other social assistance	.89 (1.27)	.81 (1.31)	.44
18	Reviewing notes & completed work	.46 (1.21)	.77 (1.34)	- 1.75
19	Reviewing texts	.46 (1.16)	.53 (1.19)	- .45
20	Other	1.05 (1.56)	.72 (1.29)	1.76
21	Overall (19 SRL strategies)	1.71 (.39)	1.66 (.40)	.91

Note. $df = (1, 226)$, Standard deviations are in parentheses

* $p < .05$, ** $p < .01$

Perusal of the results show that Semester 4 pre-service teachers surpassed Semester 2 pre-service teachers in the use of two SRL strategies, that is, seeking information and seeking peer assistance. Semester 4 pre-service teachers gave more frequent reports of seeking information from various sources such as text books, magazines, journals, and the internet. Semester 4 pre-service teachers also gave more responses indicating seeking help from their peers when undertaking learning tasks. This could be because Semester 4 pre-service teachers have begun to form closer ties with their peers after having been in college together for more than three semesters.

Semester 2 pre-service teachers, however, appeared to surpass their seniors in social environment structuring, that is, selecting or setting the social environment that supports learning. Semester 2 pre-service teachers also gave more frequent reports of memorizing information. This shows that they put in more effort at committing information to memory through this strategy compared to their seniors.

Gender differences in SRL Strategy use

This study also investigated gender differences in SRL strategy use. Independent samples *t*-test results showed that overall, there was no significant gender difference in the SRL strategy use of pre-service teachers. However, as shown in Table 3, male pre-service teachers surpassed female pre-service teachers in the use of two SRL strategies, namely, self-check and reviewing notes and completed work. Male pre-service teachers also made significantly more vague or incomplete statements (categorized as ‘other’) in their responses.

The above findings concerning gender differences in strategy use are quite different from those of other researchers (Ablard & Lipschultz, 1998; Bouffard, Boisvert, Vezeau & Larouche, 1995; Zimmerman & Martinez-Pons, 1990) who found that girls reported greater use of SRL strategies than boys did. However, the findings seem to concur with findings from a local study by Wong and Siow (2003), involving local school students aged 14-18 years in that they also found that overall, there was no significant difference ($p < .05$) in the SRL strategy use of boys and girls. Girls, however, surpassed boys in one of the strategies, that is, selecting information.

Table 3

Means and Standard Deviations and t-tests of Strategy Importance Scores by Gender

	SRL Strategy	Gender		<i>t</i>
		Male (<i>n</i> = 67)	Female (<i>n</i> = 161)	
1	Self-check	1.27 (.68)	.60 (1.26)	3.28***
2	Using other sources	2.84 (1.02)	2.76 (.97)	.55
3	Selecting information	2.47 (1.46)	2.51 (1.40)	- .17
4	Transforming information	2.24 (1.48)	1.82 (1.60)	1.84
5	Organizing information	.65 (1.36)	.69 (1.32)	- .19
6	Goal setting and planning	2.07 (1.57)	1.85 (1.51)	.95
7	Seeking information	2.97 (.94)	2.93 (.96)	.31
8	Keeping records & monitoring	2.75 (1.39)	2.59 (1.38)	.82
9	Self-environment structuring	2.98 (1.06)	2.88 (1.00)	.65
10	Physical environment structuring	.57 (1.22)	.81 (1.34)	- 1.26
11	Social environment structuring	1.04 (1.48)	1.12 (1.44)	- .40
12	Self-consequating	1.23 (1.68)	1.18 (1.66)	.19
13	Rehearsing	2.72 (1.18)	2.50 (1.26)	1.22
14	Memorizing	.58 (1.31)	.85 (1.44)	- 1.29

15	Seeking peer assistance	2.57 (1.13)	2.53 (1.15)	.28
16	Seeking teacher assistance	2.01 (1.46)	1.65 (1.39)	1.74
17	Seeking other social assistance	.87 (1.35)	.83 (1.27)	.19
18	Reviewing notes & completed work	1.14 (1.62)	.44 (1.08)	3.80***
19	Reviewing texts	.54 (1.19)	.48 (1.17)	.34
20	Other	1.26 (1.64)	.68 (1.27)	2.87*
21	Overall (19 SRL strategies)	1.74 (.45)	1.65 (.37)	1.49

Note. $df = (1, 226)$, Standard deviations are in parentheses

* $p < .05$, *** $p < .001$

CONCLUSION

Summary of Findings

This study set out to document the SRL strategies of pre-service teachers. Nineteen SRL strategies were identified from pre-service teachers' responses to seven hypothetical learning contexts. The findings show that on the whole, pre-service teachers' use of SRL strategies was "occasionally." The findings also show that Semester 2 and Semester 4 pre-service teachers differed in the use of certain SRL strategies although overall there was no significant difference in their strategy use. There was no significant gender difference in pre-service teachers' use of SRL strategies.

Implications

A number of practical implications can be drawn from the findings in this study. The findings suggest that there is a need to provide instruction and support in the use of some of the less often mentioned SRL strategies. It is particularly important to inculcate self-regulated learning practices among pre-service teachers, as they are the ones who will instruct and motivate the future generation of learners to practice self-regulation of learning.

Pre-service teachers' lack of reviewing texts, notes and completed work when preparing for tests needs to be addressed, as they can gain a lot from such practices. Pre-service teachers should also be taught to expend more effort at organizing information through making outlines and drafts as this would help to improve the quality of their work besides enhance memory for the information learned. It is also beneficial to guide pre-service teachers in using physical environment structuring strategies so that they can be more focused when spending time on their studies. It is encouraging to note that pre-service teachers don't often use rote memorization to remember information. Lecturers should perhaps instruct them in the use of transforming strategies such as constructing concept maps or mind maps, mnemonics, and visualization techniques to help them remember what they have learned (Lonka, Lindblom-Ylaine, & Maury, 1994; Novak & Gowin, 1984; Weinstein & Mayer, 1986). The practice of doing self-check also needs to be inculcated through giving them instruction and opportunities to do self-evaluation instead of relying on others to evaluate their work for them.

Semester 2 and Semester 4 pre-service teachers differed in their self-reported use of certain SRL strategies. It is beneficial to encourage Semester 2 pre-service teachers to emulate their Semester 4 counterparts in expending more effort at seeking information, thus increasing their knowledge base. Semester 2 pre-service teachers should also be encouraged to enlist the help of their peers when facing difficulties in their studies. Such a practice provides emotional support and enhances self-efficacy and motivation to learn besides helping to solve problems encountered in the learning task (Schunk, 1987; Vygotsky, 1978). Meanwhile, Semester 4 pre-service teachers should be encouraged to select or set the social learning environment that enhances learning, as this would ensure that quality learning takes place.

The finding on gender differences in SRL strategy use suggests a need to promote the use of certain SRL strategies among female pre-service teachers. Female pre-service teachers should be encouraged to make an effort to check their own work instead of relying on the help of others. They should also be encouraged to review notes and completed work as they prepare for examinations.

Suggestions for Further Research

This study documented the SRL strategy use of pre-service teachers. A replication of this study involving pre-service teachers from other colleges in Malaysia would provide further support for the generalizability of the findings.

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Appendix A

SUMMARY OF SRL STRATEGIES OF PRESERVICE TEACHERS

1. **Self-evaluation**

Statements indicating student-initiated evaluations of the quality or progress of their work.

- 1a. **Self-check** – checking their own work, doing self-tests, or doing self-reflections on the quality or progress of their work.

Examples:

“I check the assignment myself”

“I try to look for mistakes in my work before handing it in”

- 1b. **Using other sources** – comparing work with peers or textbook solutions or asking others (e.g. parents, peers, tuition teachers) to check completed work or test them (this is different from Category 10 [seeking social assistance], which is asking for help with work that is not understood.)

Examples:

“I ask the opinion of my lecturers or friends”

“I refer to examples of assignments from seniors”

2. **Organizing and transforming**

Statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning

- 2a. **Selecting information** – listing main/important points, summarizing, highlighting or underlining while reading or doing revision (this is different from Category 5 [keeping records], which is note taking.)

Examples:

“I make short notes”

“I underline the important points”

- 2b. **Transforming information** – constructing concept maps/mind maps, drawing flow charts, using acronyms/mnemonics, visualizing diagrams/processes, relating to daily experiences.

Examples:

“I try to link the important points to something I can remember”

“I draw mind maps or concept maps”

- 2c. **Organizing information** – writing outlines/drafts or mentally planning how to organize information when undertaking a task.

Examples:

“I do an outline for the essay first”

“I start by writing out the sub-topics for the assignment”

3. **Goal setting and planning**

Statements indicating students’ setting of goals or sub-goals and planning for sequencing, timing and completing activities related to those goals.

Examples:

“I do a plan of action and try to divide out the time I have for studying”

“I draw up a personal timetable for doing revision”

4. **Seeking information**

Statements indicating student-initiated efforts to secure further task information from nonsocial sources (such as magazines, reference books, internet, textbooks, notes, completed work, visits to relevant places) when undertaking an assignment (this is different from Category 11 [reviewing records], which is re-reading records before a test.)

Examples:

“I browse the internet for additional information”

“I read books on the topic discussed”

5. **Keeping records and monitoring**

Statements indicating student-initiated efforts to record information, results, or events.

Examples:

“I write down the points given by my friends”

“I note down all the important points discussed”

6. **Environmental structuring**

Statements indicating student-initiated efforts to select or arrange the learning context so as to help them learn better.

6a. **Self-environment** – student performs a particular personal behavior or makes a personal resolve so that learning is improved.

Examples:

“I drink thick coffee so that I won’t doze off”

“I try not to think of other things except the assignment that has to be completed”

6b. **Physical environment** – student selects or arranges the physical setting to make learning easier.

Examples:

“I avoid meeting my friends”

“I lock myself in my room and focus on the assignment”

6c. **Social environment** – student selects or sets the social setting that supports learning.

Examples:

“I ask my friends to cooperate and not invite me to chat with them”

“I form study groups with my course-mates”

7. **Self-consequating**

Statements indicating student imagination of rewards or punishment for success or failure.

Examples:

“I think of the consequences of not doing my assignment”

“I give myself a reward when I have completed the assignment”

8. **Rehearsing**

Statements indicating student-initiated efforts to do revision or practice exercises.

Examples:

“I do exercises often so that I can master the skill”

“I revise and try to understand the contents”

9. Memorizing

Statements indicating student-initiated efforts at remembering information through memorization.

Examples:

“I try to memorize the important points”

“I memorize the formula and try to understand it”

10. Seeking social assistance

Statements indicating student-initiated efforts to solicit help from other people when having difficulty with their work.

10a. Seeking peer assistance – efforts to solicit help from classmates.

Examples:

“I ask my course-mates for help when I have problems”

“Discuss with and ask for the help of my course-mates”

10b. Seeking teacher assistance – efforts to solicit help from the teacher.

Examples:

“I ask the lecturer when I am not sure how to do it”

“I ask the lecturer when I don’t understand the question”

10c. Seeking other social assistance – efforts to solicit help from parents, siblings, senior students, tuition teachers, and other adults.

Examples:

“I ask the seniors for help”

“I ask more experienced people for help”

11. Reviewing records

Statements indicating student-initiated efforts to revise or review relevant records such as notes, completed work, and texts when preparing for a test.

11a. Reviewing notes and completed work – efforts to review notes, tests, exercises, laboratory reports, assignments or other completed work.

Examples:

“I refer to previous work”

“I read again the notes I have made”

11b. Reviewing texts – efforts to review textbooks or reference books.

Examples:

“I refer to reference books in the library”

“I read the text books before an examination”

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